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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,040	04/01/2004	Glen Garfunkel	HT03-027	9265

7590 07/27/2007
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28 DAVIS AVENUE
POUGHKEEPSIE, NY 12603

EXAMINER

TUGBANG, ANTHONY D

ART UNIT	PAPER NUMBER
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3729

MAIL DATE	DELIVERY MODE
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07/27/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

ED

Office Action Summary

Application No.

10/816,040

Applicant(s)

GARFUNKEL, GLEN

Examiner

A. Dexter Tugbang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 May 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. The applicant(s) amendment filed on May 7, 2007 has been fully considered and made of record.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 through 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Saito et al 6,112,402.

Saito discloses a method to form a magnetically pinned layer comprising: providing a layer of antiferromagnetic material (e.g. 10) having a top surface and an edge that is different from the top surface; and depositing a layer of magnetic material (e.g. 3) by sputtering (col. 8, lines 27-35), a part of which contacts both the top surface and the edge (see Fig. 8).

Regarding Claim(s) 2 and 3, Saito further teaches that the layer of magnetic material contacts the edge through overlap of the top surface and also comprises a pair of ferromagnetic layers (free magnetic layer 3 and pinned magnetic layer 6, both made of NiFe) separated by, and contacting, an antiferromagnetic coupling layer (e.g. 7).

Claim Rejections - 35 USC § 103

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4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Saito et al, Tobise et al 5,748,416 and Gill 6,097,579.

Saito discloses a method of forming a magnetically pinned layer comprising: providing a pair of antiferromagnetic layer (left and right sections of layer 10, in Fig. 7) having coplanar top and bottom surfaces and also having angled inside edges that are different from the coplanar surfaces, the edges being separated; and depositing a layer of magnetic material (e.g. 3) by sputtering that is between, and in contact with, the antiferromagnetic layers (see Fig. 8) and overlaps the inside edges.

It is noted that the separation distance between the edges is less than the track width (lead Tw shown in Fig. 9).

Saito does not teach that the distance that separates the edges is no more than 2 microns. Furthermore, Saito does not teach a step of magnetizing the layer of magnetic material.

Tobise teaches that having the track width at a preferred distance of 3 microns or less (col. 9, lines 23-26) provides such advantages of an increased recording density and limiting Barkhausen noise by optimizing magnetic properties (col. 5, lines 42-50). The 3 microns or less of Tobise meets the claimed range of "no more than 2 microns" as the distance between the edges of Saito is less than the track width distance.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Saito by having the distance separated by the edges no more than 2 microns, as taught by the track width distance of Tobise, to provide the advantages of increased recording density and optimized magnetic properties.

Gill teaches that in depositing a layer of magnetic material (e.g. free layer 410) by sputtering, the layer is also magnetized in a magnetic field to orient the easy axis of all the ferromagnetic layers (col. 7, line 62 to col. 8, line 5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Saito by magnetizing the layer of magnetic material, as taught by Gill, to positively orient the easy axis of the ferromagnetic layers.

6. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Saito et al, Tobise et al, and Gill, as applied to Claims 4 and 6, and further in view of Hasegawa et al 5,910,344.

Saito, as modified by Tobise and Gill, discloses the claimed manufacturing method as relied upon above in Claim 4, further including that the layer of magnetic material contacts the inside edges through overlap and further comprises a pair of ferromagnetic layers (e.g. 3, 6) contacting, and separated by, an antiferromagnetic coupling layer (e.g. 5, 7 or 10). The modified Saito method does not mention that the ferromagnetic layers are “antiparallel”.

Hasegawa teaches that ferromagnetic layers (e.g. 42, 44) can be “antiparallel” in magnetization directions (see a and b directions in Fig. 3) to induce unidirectional magnetic anisotropy to stabilize the magnetic domain (col. 6, lines 12-18)..

It would have obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Saito, by having the pair of ferromagnetic layers each be magnetically antiparallel in magnetization directions from each other, as taught by Hasegawa, to positively induce unidirectional magnetic anisotropy and stabilize the magnetic domain.

Response to Arguments

7. The applicant(s) arguments with respect to Claims 1 through 6 in the reply filed on May 7, 2006 have been fully considered, but are moot in view of the new ground(s) of rejection set forth above.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Dexter Tugbang whose telephone number is 571-272-4570.

The examiner can normally be reached on Monday - Friday 7:30 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

**/A. Dexter Tugbang/
Primary Examiner
Art Unit 3729**

July 18, 2007